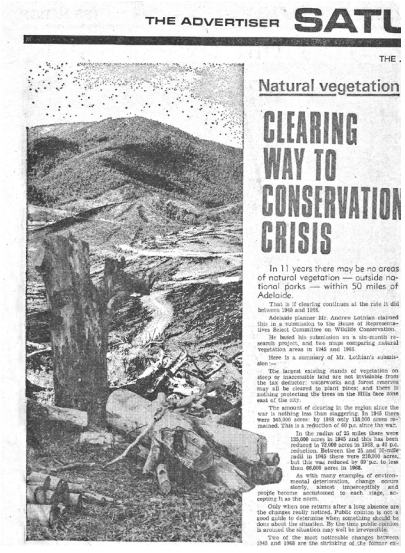
Clearance of native vegetation in the Mount Lofty Ranges 1945-68 ANDREW LOTHIAN

Retrospective and update COLIN HARRIS

Andrew Lothian PhD, C Env P, FEIANZ, spent much of his career working on environmental policy in the South Australian Department of Environment and Natural Resources in the areas of ecological sustainability, climate change, state of environment reporting, valuation and industries. He has also been involved in environmental legislation such as site contamination, housing energy rating, and climate change. Andrew is now working on landscape quality assessment in South Australia and overseas. Colin Harris PSM is now retired after a career in the South Australian Environment Department and is writing environmental history in said retirement. He is a past President of the Royal Geographical Society of South Australia and a recipient of the Public Service Medal for his work in conserving native vegetation.

Introduction

In 1970, using aerial photographs from the 1960s, Andrew Lothian plotted the extent of native vegetation remaining in the Mount Lofty Ranges. Subsequently he plotted its extent in 1945 based on military ordnance maps of that era. Comparison of the two maps indicated that substantial clearance had occurred between the two periods. Andrew presented these findings in a submission to the House of Representatives Select Committee on Wildlife Conservation at a hearing on 15 April 1971, and the findings were later reported in a full page feature in *The Advertiser* of 1 May 1971 as seen in Figure 1. Copies of the maps, measuring a metre square, were widely distributed among conservationists, national parks and a number of State Government authorities. The original maps have been deposited with the State Library of South Australia.


THE ADVERTISER SATU

Natural vegetation

CLEARING WAY TO CONSERVATION CRISIS

In 11 years there may be no areas of natural vegetation — outside national parks — within 50 miles of Adelaide.

Figure 1. Full page feature in The Advertiser *of 1 May 1971 on Andrew Lothian's submission on wildlife conservation to a parliamentary select committee*

The original paper from 1971 is presented here, reflecting the laws and issues of the time, but omitting part of the section on wildlife conservation, the understanding of which has changed since it was originally presented. Colin Harris has prepared a retrospective and update for this paper.

Research project

The object of the research was to establish, for two widely separated years, the distribution and amount of natural vegetation within a defined area. The defined area is that between St. Vincent's Gulf and the River Murray, from Cape Jervis and the Murray Mouth in the south, to Port Wakefield and Morgan in the north. This is an area of over 15,540 sq km and includes a wide range of differing vegetation types. The two years chosen for comparison are 1945 and 1968, a time span of 23 years. The research methods used to gain this information and the vegetation associations found in the defined area are briefly described. The findings for each of the years is given, together with comparison of differences between the years with supporting statistics. The conclusions will stress the type of action considered necessary to conserve those remnants of wildlife and natural vegetation found in the defined area.

Research methods

The 1968 plan shows natural vegetation, which ranges from low, thick scrub through trees with understorey to clumps of mature trees with little or no understorey. The information was transposed from aerial photographs on to maps of 1:63,360 scale, and then reduced to 1:250,000. The most up-to-date large scale photography of the time was used but in some areas, such as along the River Murray, the latest was 1965. The information shown on the plan is judged to be at least 95% accurate.

The 1945 plan was produced only at the small scale of 1:250,000. The information it contains was derived from military ordnance maps; and of the twelve maps used, all but one were produced immediately prior to or during World War Two. Land use information on these ordnance maps was derived from aerial photography and ground surveys. All maps indicate the areas of natural vegetation existing at that time. Although the maps depict the vegetation with different symbols and description, they provide a reasonably good basis—and the only one available—from which to obtain the information. The information shown on the plan is judged to be about 75% accurate, taking into account the differing amounts of detail shown on the original maps and the smaller scale at which the author's plan was produced. Its main failing, however, is its lack of coverage of the littoral section along the northern gulf, of the northern plains and especially of the mallee lands to the north east.

Because of these omissions the comparison between the years in the northern section of the defined area will be confined to that area within a 'fifty mile' or 80 km radius of Adelaide. Throughout this submission, reference to the area within fifty miles of Adelaide should be taken as meaning that area bounded by the sea, Lake Alexandrina and the River Murray north to its intersection with the fifty mile radius. 'Fifty mile radius' is a term used for the sake of convenience and it actually includes some land outside of fifty miles for example at Cape Jervis, and other land within fifty miles, for example. east of River Murray at Murray Bridge.

Vegetation types
A superficial classification of the vegetation types found in the defined area is necessary to ensure the proper interpretation of the plans. In some areas there has never been a great many trees or expanse of bushland.

The littoral vegetation includes that found in sand-dunes and on tidal salt marshes. The 1968 plan shows areas of such vegetation, but these were not included in the statistics relating to areas of natural vegetation, because such vegetation was not mapped in 1945.

Stands of mallee are found on the plains north of Adelaide toward Port Wakefield and on the eastern plains from Lake Alexandrina to Morgan. The mallee north of Adelaide was largely cleared in the 19th century.

In the somewhat wetter areas along the eastern half of the Mount Lofty Ranges and to the north is found the savannah woodland formation. This is characterised by well-spaced trees; only on wetter hilltops and in valleys do they form contiguous clumps. Only these clumps are shown on the plans. Native grasses originally covered the savannah woodland areas but have now vanished due to grazing. Continued grazing has inhibited regeneration of trees in these areas, and unless action is taken now they will gradually become quite barren of trees.

In particularly dry areas along the eastern side of the ranges there are virtually no trees or shrubs at all outside of the watercourses. The eastern range from Palmer to Eudunda is the main barren area.

The main areas of natural vegetation shown on the plans are of dry sclerophyll forests. These are found only in the wettest regions of the State, mainly in the Mount Lofty Ranges. They are confined to the ranges by wide expanses of mallee or grazing land separating them from their nearest counterparts in western Victoria and the Flinders Ranges. Many different species and associations are found in the dry sclerophyll formation, according to the different rainfall received.

1945 plan
Many large and contiguous tracts of natural vegetation were still present at the end of World War Two as seen in Figure 2. From Williamstown in the north to Cape Jervis in the south was an almost continuous band of vegetation, with the Inman Valley providing the only break of any significance.

The area south of Inman Valley then contained the largest single stand—totalling some 55,000 acres (22,258 ha). Somewhat less contiguous but large stands (36,000 acres or 14,574 ha) occurred north of the Inman Valley. The Mount Magnificent area contained 20,000 acres (8,097 ha) of bush while northwards there were further contiguous stands of 12,500 acres (5,060 ha) at Mt Bold, 7,000 acres (2,834 ha) in the Belair area, 9,000 acres (3,650 ha) along the hills face and over 20,300 acres (8,200 ha) from Millbrook Reservoir to the South Para River.

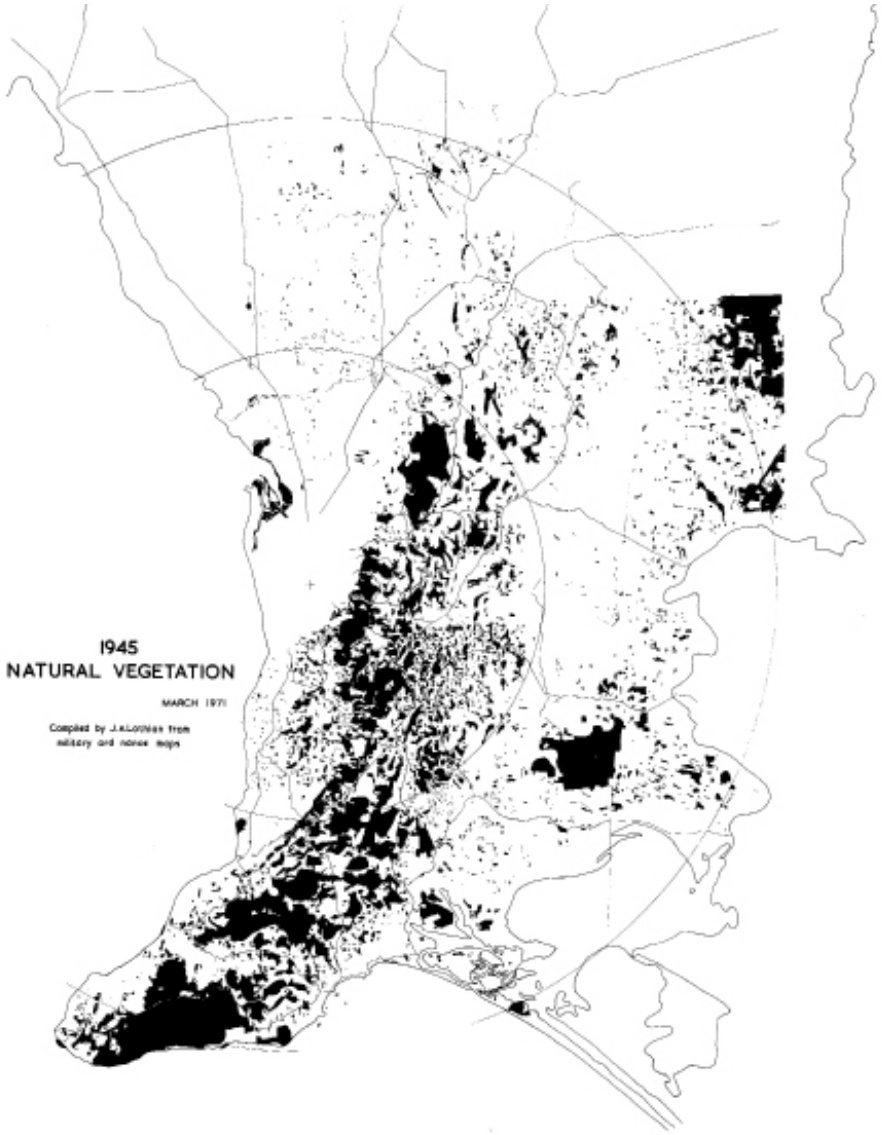


Figure 2. Natural vegetation in 1945 compiled by the author from military ordnance maps

There are many hundreds of smaller areas throughout the central and southern ranges. The range of botanical associations represented then would surely have been virtually as complete as when white man first settled in the State. To the north there were stands of vegetation, not large but representative. A single tract of mallee of over 21,000 acres (8,500 ha) existed in the Langhorne Creek area. Extensive areas also occurred in the mallee lands.

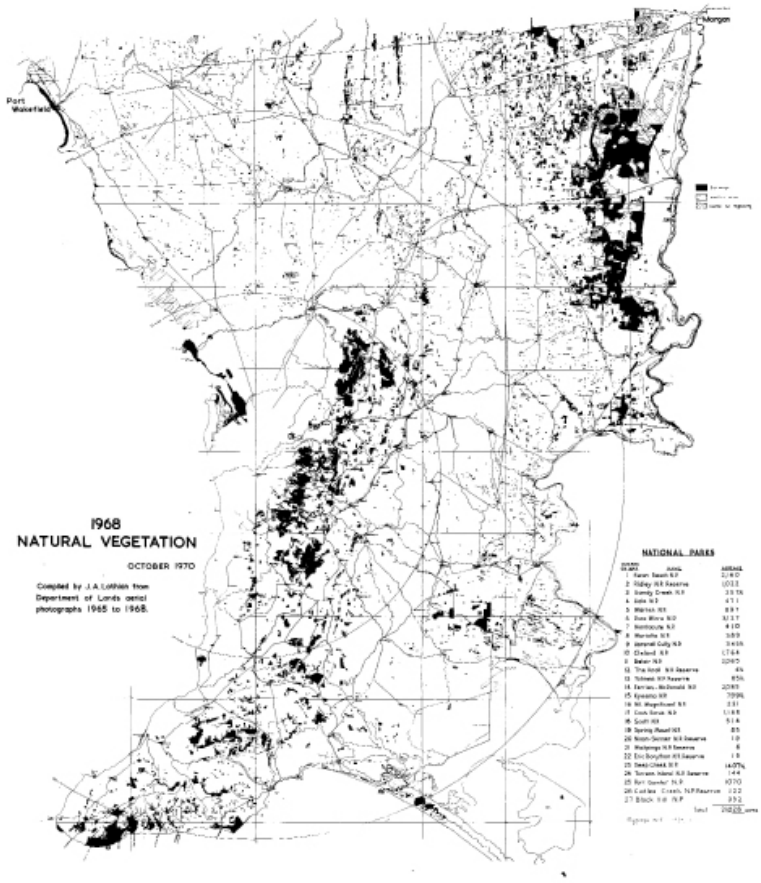


Figure 3. Natural vegetation in 1968 compiled by the author from Department of Lands aerial photography 1965-68

1968 plan

The immediate impression to be gained from this plan as shown in Figure 3 is that there are three main areas of natural vegetation remaining. The largest is the mallee to the north-east, then the sclerophyll forests in the central Mount Lofty Ranges, and lastly the pockets of forests in the southern ranges. A more detailed examination will indicate the small number of extensive areas, and the relatively greater number of small and isolated clumps. The single largest and contiguous stand is of over 11,000 acres (4,451 ha) in the vicinity of Deep Creek. A larger, but not contiguous stand of about 12,000 acres (4,856 ha) is found in the Para Wirra area. Other large stands are found along the western face of the ranges—totally a little over 8,500 acres (3,440 ha), around the Mount Bold Reservoir (6,700 acres, 2,711 ha) and in the vicinity of the South Para Reservoir (4,600 acres, 1,862 ha).

In the 1,500–3,000 acre (607–1,214 ha) range are included stands at Waitpinga south of the Inman Valley, the Mount Magnificent area near Mount Compass, the vicinity of the Belair National park, Forest Range and around Millbrook Reservoir.

Most of the larger stands of vegetation in the Mount Lofty Ranges owe their continued existence to the steepness of the land upon which they are situated or to their public ownership. On the steep hill slopes along the Inman Valley and east of Adelaide in the central ranges and in many other areas the clearing of the land would be difficult and would probably hasten erosion.

Reserves such as Waterworks Reserves around reservoirs, Forest Reserves and National Parks have helped retain many of the larger tracts of vegetation. Those areas at Warren, Para Wirra and South Para, Millbrook, Mount Bold, Belair and Kyeema-Mount Magnificent, and Cox's Scrub are wholly or almost entirely under some form of public ownership.

Overall, the number of vegetation associations found in the ranges is diminishing. Clearing is proceeding on all but the too steep and the inaccessible regions and thus the valley, river and swamp associations are rapidly vanishing.

In the hilly region in the upper centre of the 1968 plan, savannah woodland predominates. Small isolated clumps of vegetation remain principally north of Nuriootpa and north of Kapunda. The stony hilltop ridges in the vicinity of Marrabel contain long ribbons of vegetation. To the west, in the former mallee lands, numerous tiny clumps remain. The ancient sand dunes north-west of Gawler and south of Bowmans are particularly interesting botanically. Similar relic sand dunes are found north of Lake Alexandrina.

The large area of mallee north-east of Langhorne Creek is a National Park. Numerous small clumps of mallee are found through to the northern mallee lands.

The extensive areas of mallee found in the north-west of the defined area, near Morgan, total about 110,000 acres (44,515 ha) of dense mallee and about 50,000 acres (20,234 ha) of medium dense mallee. In an additional area, some 26,000 acres (10,522 ha) show evidence of clearing at some stage which is apparent from the aerial photographs. However, the areas have since been allowed to regenerate. The only plausible explanation of expending large amounts of money in clearing it and then leaving it can be found in Section 75(1)(b) of the *Income Tax Assessment Act*—the obnoxious and thoroughly undeserving clause which gives large income earners the right to claim as tax deductions the cost of clearing a national heritage. This will be referred to later.

Comparison between 1945 and 1968 of the area within 50 miles (80 km) of Adelaide

If the rate of clearing as indicated in the comparison of these two plans continued, then by 1986 there may be no areas of natural vegetation left outside of National Parks within 50 miles of Adelaide. No qualification is necessary to this statement.

Existing stands of vegetation on steep or inaccessible land are not inviolable from the tax deductor; waterworks and forest reserves may all be cleared to plant pines; and there is nothing protecting the trees on the Hills Face Zone east of the city. The amount of clearing in the region since the War is nothing less than staggering. In 1945 there were 341,190 acres (138,075 ha); by 1968 only 159,882 acres (64,702 ha) remained. This is a reduction of 46.9%.

In the radius of 25 miles (40 km) of Adelaide there were 144,000 acres (58,300 ha) in 1945; this has been reduced to 76,700 acres (31,000 ha) in 1968, a 53.3% reduction. Between the 25 and 50 mile (40–80 km) radii of Adelaide, in 1945 there were 197,200 acres (79,800 ha) but this was reduced by 42.2% to 83,200 acres (33,600 ha) in 1968.

A comparison between the 14 regions for the two years is provided in Table 1.

As with many examples of environmental deterioration, change occurs slowly, almost imperceptibly, and people become accustomed to each stage, accepting it as the norm. Only after returning from a long absence are the changes really noticed. Public opinion is not a good guide to determining when something should be done about the situation. By the time public opinion is aroused the situation may well be irreversible.

Two of the most noticeable changes which occurred between 1945 and 1968 are the shrinking of the previously extensive tracts of vegetation, and their separation into isolated clumps. Where formerly the large areas were measured in tens of thousands of acres, now they are in mere thousands. Where formerly the Inman Valley was the only break of any consequence in an otherwise continuous band of vegetation down the ranges, now it itself is wider and only one of many such breaks. Where formerly all botanical environments existed, including river, swamp, valley, plains, hill slopes, ridge tops or hill tops, now only the slopes and tops of hills are adequately represented.

Wildlife conservation

What has all this to do with wildlife conservation? It is through the destruction and decimation of their habitats above all else, which has reduced wildlife populations. No discussion on the conservation of animal species can be divorced from consideration of their habitat. If habitat is wiped out through ignorance if not intention, the life that habitat supported, also perishes. Statutory protection of species is quite worthless without protection of the habitats that support them.

Because the Mount Lofty Ranges are separated widely from similar environments, they have tended to develop as an island ecology. Some of its species of birds, for instance, have developed differently compared with elsewhere in Australia. Its fauna is generally regarded as similar to the coastal fauna of south eastern Australia. Because of its isolation the populations of native species are finite: they are not replenished from elsewhere as they die out.

Table 1. Natural vegetation areas within 50 miles (80 km) of Adelaide

The figures have been converted into hectares from the original acres.
The Mount Lofty area boundaries map in Figure 4 opposite shows the regions.
An error in the 1968 total has been corrected.

	1945 Ha	1968 Ha	Diff. Ha	1968 as % of 1945	Diff. as % 1945
Total area	138075	64702	-73373	46.86	-53.14
Within 25 miles (40 km)	58282	31051	-27231	53.28	-46.72
Between 25-50 miles (40 – 80 km)	79792	33651	-46141	42.17	-57.83

Region	1945 Ha	1968 Ha	Diff. %	1968 as % of 1945	Diff. as % 1945
1. South of Inman River	19749	10522	-9227	53.28	-46.72
2. North of Inman River, to 25 mile radius, east to plains	31768	9551	-22217	30.06	-69.94
3. Eastern plains south of Milang Railway	2792	728	-2064	26.09	-73.91
4. Western plains south of Onkaparinga River	688	283	-405	41.18	-58.82
5. Area between 25 mile radius, Murray Bridge Road, Onkaparinga River but excluding western plains	18089	5827	-12262	32.21	-67.79
6. Eastern plains between Murray Bridge road and Milang Railway	12869	4371	-8498	33.96	-66.04
7. Plains west of Main South Road and Hills Face Zone to Gawler River	198	174	-24	87.76	-12.24
8. Area between Onkaparinga River, western plains and Torrens River	19627	14407	-5220	73.40	-26.60
9. Area between Murray Bridge Road, 25 mile radius and Onkaparinga River	3764	344	-3420	9.14	-90.86
10. Area east of 25 mile radius and between Murray Bridge Road and Mannum Road	1457	809	-647	55.56	-44.44
11. Area between western plains, Torrens River, North Para River and eastern plains	17685	11129	-6556	62.93	-37.07
12. Eastern plains to 50 mile radius, north from Mannum Road	5099	2469	-2630	48.41	-51.59
13. Area west of Main North Road, between Gawler R. & 50 mile radius	931	1093	162	117.39	17.39
14. Area between Main North Road, North Para River & 50 mile radius	3359	2995	-364	89.16	-10.84
Total	138074	64701	-73373	46.86	-53.14

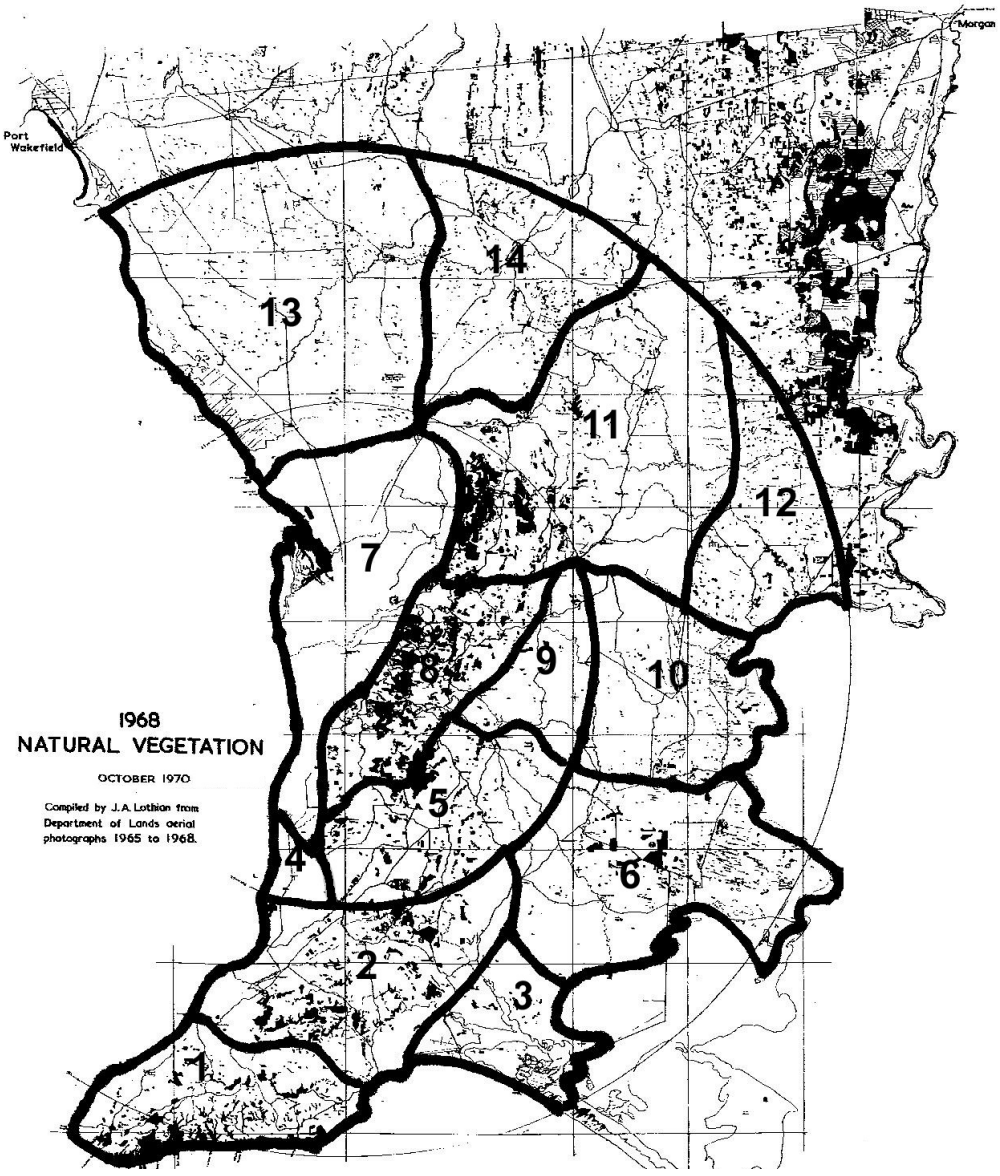


Figure 4. Boundaries of regions as described in Table 1 opposite


From this—Talisker Road at Cape Jervis to this—Tent Rock Road at Deep Creek. Courtesy Andrew Lothian

According to Peter Aitken, Mammalogist at the South Australian Museum, there were thirty species of mammals originally present in the Mount Lofty Ranges. Thirteen of these are now considered extinct or rare in the Ranges. Of the remaining animals considered abundant or common, species of native rats, mice, possums and bats predominate. Only one species of each of the kangaroo, bandicoot and anteater exist where formerly they totalled eight. The pioneering notions of farmers that these animal species represent competition for them must be soundly routed. Such ideas which are used to justify their extermination are no longer acceptable when their relatively small populations are considered. What little trouble they cause or grain they eat is due to their habitats being of insufficient size. If the diversity of species is to be retained then it is necessary to set aside large natural areas for them and these reserves must be managed according to ecological principles. A range of environments should be present since each environment supports species peculiar to it.

Action required

The present legislative endorsement of the clearing of natural vegetation must be abolished. Section 75(1)(b) must be struck from the *Income Tax Assessment Act*. In fact, legislation should be passed penalising such clearing. Positive clauses which recognise the value of trees and natural areas to farmers and to the community should be inserted. Tax relief should be obtained by all of the following:

- farmers who fence off sections of their property and allow its natural regeneration
- farmers who undertake active tree planting schemes on their property
- any persons or companies who purchase natural areas and hand them over to the State for management
- any persons or companies who donate money for the purposes of nature conservation.

Further legislation should enable citizen groups to take action to halt the clearing of specific sites of natural vegetation. A review of the clearing should then be made, possibly by a court or appeal board, with evidence for and against its clearing

produced. The onus should be on the person wishing to clear the vegetation to prove their case. It should be proven not only to be of substantial benefit to the community but also without serious detriment before clearing is permitted.

Commonwealth financial aid to the States is required to enable them to assess their natural resources, to purchase areas and to properly manage them. The Commonwealth should set up an Office for the Conservation of Natural Resources. Among its duties would be to assess, in conjunction with similar state departments, the relative scarcity of animal species and thus establish national priorities for their conservation. Special grants could then be made to ensure the conservation of what is a national, rather than a regional heritage. Much action at a state level is also called for. There needs to be an active program to create national parks, to enlarge the stands of natural vegetation, to provide for connections between stands, to research and assess areas and to actively manage them. However, without massively increased financial aid from the Commonwealth, none of these very necessary courses of action will be possible.

Conclusions
Six years of experience in the conservation field and professional training as a planner has been drawn upon in preparation of this submission. It deals with one subject, the clearing of natural vegetation, and is presented with the aim of making people aware of the enormity of change which occurs, imperceptibly but over a long period of time. Various remedial courses of action are suggested. These are not at all radical or impossible courses. They are in fact the bare minimum required in the circumstances at what is a critical stage for conservation in Australia. In all matters relating to conservation one should not wait for public opinion to force action for, as noted early in this submission, the community will be roused only when the situation has reached a critical stage—it may then be too late. The next few years are critical for the conservation of the natural environment. Remedial action not initiated immediately may be of little consequence to conservation, for shortly there will be nothing of value left to conserve.

Retrospective and update

by Colin Harris

At the time Andrew Lothian prepared the above submission South Australia had created a portfolio of Minister for Environment and Conservation, but it was to be another year before a public service department was established to support the Ministry. Establishment of the department had been recommended in the third interim Report of the Jordan Committee on Environment (22 October 1970), the Committee having been established in February 1970 with wide ranging terms of reference to enquire in the state of South Australia's environment and how it might be improved (Jordan et al 1972).

Although the Jordan Committee did not devote a lot of its attention to vegetation clearance, being more concerned with issues such as pollution and waste management, it was not surprising that it was seen as a high priority within the newly established department. Individuals such as Andrew Lothian, and organisations such as the Nature Conservation Society of South Australia, were drawing attention to the ongoing clearance and highlighting the loss of conservation values that it entailed. All Australian states had, of course, been encouraging land clearance from the very earliest days of European settlement, and in South Australia perpetual leases issued by the Crown for agricultural regions continued to include a compulsory clearance requirement until 1983. And as Andrew detailed in his submission above, the Commonwealth Government was encouraging native vegetation clearance through income tax concessions.

Times and attitudes were changing, however, and in 1972-73 the South Australian Government's State Planning Authority moved to curb land clearance on Kangaroo Island through planning controls. In the face of concerted landholder opposition the plan was eventually dropped, but broader community concern about clearance continued, and in early 1974 the South Australian Government established a wide ranging internal inquiry into land clearing throughout the agricultural regions of South Australia. In 1977 the report of the inquiry was released for community consultation and the findings were startling: around 75% of the original vegetation had been cleared from the state's agricultural regions and in some regions the amount of cover remaining was less than 5% (Harris 1976).

It was several years before the Inquiry's key recommendations were implemented, a delay largely caused by the time needed to cost its proposals and to develop the legal mechanisms recommended for introduction. Some of the delay was also due to political reluctance to tackle what was, correctly, seen to be a difficult and controversial issue. However, with the delay came a change in Government, and the incoming Liberal Government of Premier David Tonkin committed itself to the introduction of a voluntary Heritage Agreement Scheme, more or less as recommended in the Inquiry's original report. The essence of the scheme was to offer financial incentives to landholders prepared to enter into Heritage Agreements to retain and manage significant areas of native vegetation on their land. At the time, the Heritage Agreements represented a novel legal approach to achieve conservation objectives, moving away from common law mechanisms of covenants and easements to a more positive management-orientated regime which would also bind successors in title to the land, thereby ensuring conservation in perpetuity on private lands (James 1976).

In the first two years of the Scheme over 450 landholders expressed an interest in Heritage Agreements and from this came a commitment of $450 000 to fund incentive payments for 170 sites covering around 15,000 hectares (Bishop 2002). At the same time, it was clear that a voluntary approach to minimising land clearance had its limitations:

- by 1982 less than 1% of native vegetation remaining in the agricultural regions had been approved for inclusion in the Scheme

- few farmers intent on clearance were prepared to modify their plans
- aerial monitoring indicated that clearance rates remained high.

In 1982 a Labor Government was returned to office under Premier John Bannon. It brought with it an election commitment to take stronger measures against land clearance, but few landholders could have predicted the swiftness with which the Government moved to implement the commitment. Only months after the election, Regulations under the *South Australian Planning Act*, 1983 were introduced on 12 May 1983 defining land clearance as a change in land use which would require approval from the South Australian Planning Commission. To avoid panic clearance there was no prior consultation. There was also no compensation payable when clearance was refused and this was a particular concern for the principal farmer organisation at the time, the United Farmers and Stockowners.

Inevitably the controls became the subject of legal challenge, and in a case which was eventually decided by the High Court of Australia, a majority judgement found that the landholder in question was protected by an existing use provision in the legislation because he was clearing regrowth from a previous valid clearance. Whilst not invalidating the controls, the judgement did weaken them, and a period of intensive negotiation and discussion between the Government, conservation organisations and the United Farmers and Stockowners followed.

The upshot was agreement on a number of key points and principles:
- controls on the broad-acre clearance of native vegetation were necessary
- areas refused clearance approval needed to be managed for conservation purposes
- disaffected landholders were unlikely to provide sympathetic management
- compensation should be provided to landholders when clearance was refused
- compensation should be conditional on landholder agreement to enter a Heritage Agreement
- the controls should be removed from the State's planning system.

With bipartisan support, the principles were enshrined in a new piece of legislation, a *Native Vegetation Management Act*, 1985. The provision of compensation, along with a five person decision-making Authority which included both farming and conservation interests, effectively brought to a close what had been a long and divisive dispute. Legal closure came with a new *Native Vegetation Act*, 1991 which formally closed down broad-acre clearance throughout the State.

In the process over 500,000 ha of remnant vegetation on privately owned land in the agricultural regions of the State had been secured for conservation management, over 1,000 Heritage Agreements had been entered into, and around $70 million paid in compensation to landholders refused clearance approval (Harris 1996). It was an initiative that was recognised at the time as world best practice (de Klemm & Shine 1993) and it was some years before (most) other Australian states followed with their own variants of what had been pioneered in South Australia.

Voluntary Heritage Agreements continue to be negotiated in South Australia. The total of all agreements—the early voluntary agreements, those required as a quid pro quo for compensation and subsequent voluntary ones—is now over 1,500 and the area involved is almost 650,000 ha, which is just under 5% of South Australia's agricultural regions.

It was a tribute to the efforts of many organisations and individuals that broad-acre clearance in South Australia was brought to a close as early as it was, and there is no doubt that submissions such as the one prepared by Andrew Lothian were influential in bringing this about. From an ecological point of view, the cessation of clearance was always going to come too late, and even the most enlightened management of remnant native vegetation on both private and public lands is not going to prevent the localised decline and in some cases extinction of plant and animal species in heavily cleared regions such as the Mt Lofty Ranges and Yorke Peninsula. The challenge for the future is to retain as much as we can for as long as we can.

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